

WHAT IS CLAIMED IS:

1. An electronic imaging system for capturing an image of a scene; said imaging system comprising:
 - (a) an optical system for producing an optical image of the scene;
 - (b) an imaging sensor having a surface in optical communication with the optical system; and
 - (c) a plurality of imaging elements distributed on the surface of the imaging sensor for converting the optical image into a corresponding output signal, said imaging elements located according to a distribution representable by a nonlinear function in which the relative density of the distributed imaging elements is greater toward the center of the sensor, wherein the distribution provides physical coordinates for each of the imaging elements corresponding to a projection of the scene onto a non-planar surface, thereby compensating for perspective distortion of the scene onto the non-planar surface.
2. The system of claim 1 wherein the non-planar surface is a cylinder.
3. The system of claim 1 wherein the non-planar surface is a sphere.
4. The system of claim 2 wherein the optical system includes a lens and the axis of rotation of the cylinder intersects a nodal point of the lens.
5. The system of claim 3 wherein the optical system includes a lens and the center of the sphere is located at a nodal point of the lens.
6. The system of claim 2 wherein the radius of the cylinder is a function of a focal length of the optical system.

7. The system of claim 3 wherein the radius of the sphere is a function of a focal length of the optical system.

8. The system of claim 1 wherein the imaging sensor is a charge-coupled device.

9. The system of claim 1 wherein the imaging sensor is a CMOS device.

10. The system of claim 1 wherein the output signal includes data from a plurality of images.

11. The system of claim 10 further including a processor for combining the images into a composite image, whereby the processor can operate directly on the output signal without having to warp the image data.

12. The system of claim 11 further including a projector for projecting the composite image onto a planar surface.

13. An electronic image sensor for use in an electronic imaging system for capturing an optical image of a scene; said sensor comprising:

(a) a surface in optical communication with the scene; and

(c) a plurality of imaging elements distributed on the surface of the sensor for converting the optical image into a corresponding output signal, said imaging elements located on the surface according to a distribution representable by a nonlinear function in which the relative density of the distributed imaging elements is greater toward the center of the sensor, wherein the distribution provides physical coordinates for each of the imaging elements corresponding to a projection of the scene onto a non-planar surface, thereby compensating for perspective distortion of the scene onto the non-planar surface.

14. The sensor of claim 13 wherein the non-planar surface is a cylinder.

15. The sensor of claim 13 wherein the non-planar surface is a sphere.

16. The sensor of claim 13 wherein the imaging sensor is a charge-coupled device.

17. The sensor of claim 13 wherein the imaging sensor is a CMOS device.

18. A digital camera containing the image sensor of claim 13.

19. In an electronic imaging system including an image sensor for converting an optical image into an output signal, the improvement wherein the image sensor comprises a plurality of imaging elements distributed on a surface of the sensor for converting the optical image into a corresponding output signal, said imaging elements located on the surface according to a distribution representable by a nonlinear function in which the relative density of the distributed imaging elements is greater toward the center of the sensor, thereby compensating for perspective distortion of the scene onto a non-planar surface.

20. The system of claim 19 wherein the imaging sensor is a charge-coupled device.

21. The system of claim 19 wherein the imaging sensor is a CMOS device.

22. The system of claim 19 further including the improvement wherein the image sensor is a component in a digital camera.

23. A method of generating a composite digital image from at least two source digital images, said method comprising:

- (a) generating the source digital images from an imaging source having imaging elements distributed so as to compensate for perspective distortion of the scene onto a non-planar surface; and
- (b) combining the source digital images to form a composite digital image.

24. The method of claim 23 further comprising the step (c) of projecting the composite digital image onto a planar surface.

25. The method of claim 23 wherein the two source digital images overlap in overlapping pixel regions.

26. The method of claim 23 wherein the non-planar surface is a cylinder.

27. The method of claim 23 wherein the non-planar surface is a sphere.